

REMARKS

The Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-8 and 12-23 are currently being prosecuted. Claims 9-11 and 24-26 are canceled, and claims 1, 4, 5, 12, 14, 16, and 21 are amended. Claim 1 is independent.

Claim for Priority

It is gratefully acknowledged that the Examiner has recognized the Applicants' claim for foreign priority. In view of the fact that their claim for foreign priority has been perfected, no additional action is required at this time.

Drawings

The Applicants have not received a Notice of Draftsperson's Patent Drawing Review, Form PTO-948, indicating whether the formal drawings have been approved by the Official Draftsperson. Clarification with the next official communication is respectfully requested.

Acknowledgement of Information Disclosure Statement

The Examiner has acknowledged receipt of the Information Disclosure Statements filed December 15, 2000; April 19, 2001; and May 22, 2002. Initialed copies of the Forms PTO-1449 have been returned by the Examiner. No further action is necessary at this time.

Restriction/Election of Species Requirements


The Examiner has made final the restriction and election of species requirements and has withdrawn claims 9 to 26 from further consideration. Non-elected claims 9-11 and 24-26 are canceled. However, non-elected claims 12-23 are not canceled, since each of these claims depends, either directly or indirectly, from independent claim 1, which is believed to be allowable. Upon allowance of independent claim 1, the Applicants respectfully request examination and allowance of withdrawn claims 12-23. Further, the Applicants reserve the right to file one or more divisional applications directed to the subject matter of the non-elected claims at a later date if they so desire.

Rejection under 35 U.S.C. §103(a)

Claims 1-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over EP 1 050 353 in view of Garza-Ondarza et al. (U.S. 6,073,678). This rejection is respectfully traversed.

A complete discussion of the rejection is set forth in the Office Action and is not repeated here.

While not conceding the appropriateness of the rejection, but merely to advance prosecution of the present application, independent claim 1 is amended herein to incorporate a portion of the subject matter of claim 4. More specifically, amended claim 1 clarifies that each of the cooling member-restoring mechanisms (48a-c) comprises transport means (58) to which the cooling member (19) is detachably attached and which is capable of gripping and successively transporting the cooling member (19) through respective restoring treatment



stations (i.e., cooling means 50, solidified-matter removing means 52, coating means 54, and drying means 56).

The remaining apparatus claims are revised to depend from amended claim 1. In light of these changes, all of the apparatus claims should now be treatable in a single application. Apparatus claims 9-11 and method claims 24-26 are canceled.

Although a specific rejection was made, to improve clarity, claim 5 is amended to clarify that the restoring treatment serves to remove adhered metallic matter from the vessel and to resurface the vessel, as indicated in the paragraph bridging pages 28 and 29 of the present specification.

While EP 1 050 353 describes a basic manufacturing method for a semisolidified metal, this reference does not disclose or suggest any details relevant to the claimed cooling member restoring mechanisms. Although a restoring process may be shown and discussed in connection with FIG. 5 of the EP '053, no specific transport means is disclosed by which the cooling members can be automatically gripped and conveyed through respective treatment stations, as set forth in claim 1 of the present application. Further, there is no teaching as to where the cooling member restoring processes are located and performed with respect to other apparatus elements. Finally, there is no suggestion whatsoever of providing a plurality of sets of cooling member restoring mechanisms arranged specifically proximate other apparatus elements, for achieving the advantages stated in the present application.

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Therefore, the procedures described in EP '353 suffer from the very same disadvantages discussed in the background section of the present specification. See page 2, line 1, through page 3, line 19. The advantages of the present invention achieved by using a plurality of sets of cooling member restoring mechanisms, each including dedicated transport means, are clearly not suggested in the cited prior art.

The Office Action contends that EP '353 discloses all features of the present invention except for providing a plurality of sets of semisolidified metal-producing mechanisms. However, as noted above, the Office Action fails to adequately address the features of the invention directed to the claimed cooling member restoring mechanisms. Even if it were possible to modify EP '353 to provide certain features thereof in a plurality of sets, the more specific features pertaining to the claimed cooling member restoring mechanisms, as discussed above, are still not shown or suggested by either of the cited references. Thus, the combination would still fall short of the features set forth in the amended claims.

Accordingly, it is respectfully submitted that the combination of elements set forth in independent claim 1 is not disclosed or made obvious by the prior art of record. Accordingly, reconsideration and withdrawal of the outstanding rejection are respectfully requested.

CONCLUSION

The stated grounds of rejection has been properly traversed, accommodated, or rendered moot. It is believed that a full and complete response has been made to the outstanding Office Action, and that the present application is in condition for allowance.

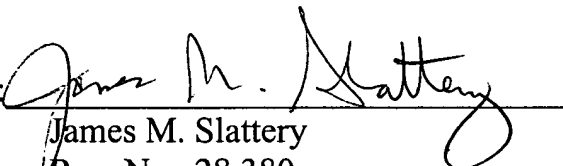
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If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, he is invited to telephone Carl T. Thomsen (Reg. No. 50,786) at (703) 205-8000.

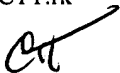
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By: 
James M. Slattery
Reg. No. 28,380

303-437P
Attachment
JMS:CTT:rk



P. O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

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MARKED-UP COPY OF AMENDED CLAIMS

Please **cancel claims 9-11 and 24-26** without prejudice or disclaimer.

Please **amend claims 1, 4, 5, 12, 14, 16, and 21** as follows:

1. (Amended) An apparatus for producing a metal formed product, comprising:
 - a holding furnace for holding molten metal;
 - a semisolidified metal-producing mechanism provided with a vessel for accommodating a predetermined amount of said molten metal therein, for agitating said molten metal in said vessel to give a predetermined slurry state by using a cooling member to obtain semisolidified metal;
 - a cooling member-restoring mechanism arranged adjacent to said semisolidified metal-producing mechanism, for applying a restoring treatment so that said cooling member has a desired function;
 - a forming mechanism for forming said semisolidified metal to have a predetermined shape; and
 - an articulated robot capable of transporting said vessel to said holding furnace, said semisolidified metal-producing mechanism, and said forming mechanism, wherein:
 - said articulated robot is arranged to be linearly movable back and forth between said holding furnace and said forming mechanism; [and]

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a plurality of sets of said semisolidified metal-producing mechanisms and said cooling member-restoring mechanisms are arranged along a direction of back and forth movement of said articulated robot; and

each of said cooling member-restoring mechanisms comprises transport means to which said cooling member is detachably attached and which is capable of gripping and successively transporting said cooling member through respective restoring treatment stations.

4. (Amended) The apparatus for producing [said] a metal formed product according to claim 1, wherein said cooling member-restoring mechanism includes:

[a] cooling means for applying a cooling treatment to said cooling member;

[a] solidified matter-removing means for removing solidified [matters] matter adhered to a surface of said cooling member;

[a] coating means for coating said cooling member with a ceramic material; and

[a] drying means for applying a drying treatment to said cooling member[; and a],

wherein said transport means [to which said cooling member is detachably attached and which is capable of gripping and] successively [transporting] transports said cooling member to said cooling means, said solidified matter-removing means, said coating means, and said drying means.

5. (Amended) The apparatus for producing [said] a metal formed product according to claim 1, further comprising a vessel-restoring mechanism arranged adjacent to said

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holding furnace and said semisolidified metal-producing mechanism, for applying a restoring treatment [to] for removing adhered metallic matter from said vessel [so that] and for resurfacing said vessel [has a desired function].

12. (Amended) [An] The apparatus for producing a metal formed product according to claim 1, [comprising] wherein said forming mechanism comprises an injection sleeve for introducing said semisolidified metal thereinto, wherein:

[a holding furnace for holding molten metal;

a semisolidified metal-producing mechanism provided with a vessel for accommodating a predetermined amount of said molten metal therein, for agitating said molten metal in said vessel to give a predetermined slurry state by using a cooling member to obtain semisolidified metal;

a cooling member-restoring mechanism arranged adjacent to said semisolidified metal-producing mechanism, for applying a restoring treatment so that said cooling member has a desired function;

a forming mechanism for forming said semisolidified metal to have a predetermined shape; and

an articulated robot capable of transporting said vessel to said holding furnace, said semisolidified metal-producing mechanism, and said forming mechanism, wherein:]

said vessel is designed to have substantially the same opening shape as a shape of an opening of said injection sleeve for introducing said semisolidified metal; and

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a gripping engaging section, with which a gripping mechanism of said articulated robot is engageable, is provided at only one side surface of said vessel.

14. (Amended) [An] The apparatus for producing a metal formed product according to claim 1, [comprising] wherein:

[a holding furnace for holding molten metal;

a semisolidified metal-producing mechanism provided with a vessel for accommodating a predetermined amount of said molten metal therein, for agitating said molten metal in said vessel to give a predetermined slurry state by using a cooling member to obtain semisolidified metal;

a cooling member-restoring mechanism arranged adjacent to said semisolidified metal-producing mechanism, for applying a restoring treatment so that said cooling member has a desired function;

a forming mechanism for forming said semisolidified metal to have a predetermined shape; and

an articulated robot capable of transporting said vessel to said holding furnace, said semisolidified metal-producing mechanism, and said forming mechanism, wherein:]

said articulated robot includes a gripping mechanism which is engageable with a gripping engaging section provided at only one side surface of said vessel, [and] said gripping mechanism [is provided with] comprising:

[a] first clamp means for directly gripping said gripping engaging section; and

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[a] second clamp means for gripping said first clamp means gripping said gripping engaging section, integrally with said vessel.

16. (Amended) [An] The apparatus for producing a metal formed product according to claim 1, wherein said forming mechanism comprises an injection sleeve for introducing said semisolidified metal thereinto, said metal formed product being produced by introducing a solid-liquid co-existing metal into [an] said injection sleeve through an opening of said injection sleeve to produce said metal formed product, said apparatus further comprising:

[a] guide means which is engageable with said opening by making movement back and forth from a position over said opening of said injection sleeve and which is capable of guiding said solid-liquid co-existing metal to said opening; and

[a] cover means which is capable of closing said opening by covering said opening of said injection sleeve from an upward position.

21. (Amended) [An] The apparatus for producing a metal formed product according to claim 1, [by introducing solid-liquid co-existing metal into a forming mechanism to produce said metal formed product,] wherein said forming mechanism [includes] comprises:

an injection sleeve [into which said] for introducing said semisolidified metal thereinto, said metal formed product being produced by introducing a solid-liquid co-existing metal [is introduced] into said injection sleeve through an opening [and] of said injection sleeve which communicates with a cavity[;], said apparatus further comprising:

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a plunger for charging said solid-liquid co-existing metal in said injection sleeve into said cavity; and

a cooling medium-jetting mechanism for jetting a cooling medium toward said solid-liquid co-existing metal through said opening.

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